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**PATENT APPLICATION
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**SYSTEM AND METHOD FOR REQUESTING SERVICE
FOR IMAGING DATA TO A WEB SERVICE**

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2 SYSTEM AND METHOD FOR REQUESTING SERVICE
3 FOR IMAGING DATA TO A WEB SERVICE

4 The present invention generally relates to an improved system
5 and method for servicing imaging data stored in a personal imaging repository.
6 More specifically, it relates to an improved system and method for servicing
7 imaging data stored in a personal imaging repository by a requested web
8 service operably connected to a computing device requesting the service.

9 Computing devices are becoming more mobile as technology
10 allows them to be faster, smaller and lighter. The sizes, capacities and features
11 of these computing devices vary greatly, ranging from the typical desktop
12 computer to a hand-held personal digital assistant ("PDA"). Nevertheless, even
13 with all the improvements in current computing devices, services to these
14 devices generally require preconfiguration before service can be utilized, and
15 each service requires a specific preconfiguration. In other words, each service

1 may require a distinct preconfiguration process necessitating separate software
2 installation. For example, each model of various printers, even when
3 manufactured by the same company, may require different drivers, and in some
4 cases, software applications. As another example, each requested web service
5 may require different drivers and preconfiguration.

6 Many currently available printing systems implemented with a
7 web interface use specialized printer driver devices and port monitors to
8 capture the imaging information for uploading to the server providing the
9 printing. However, with these current systems, the imaging information is
10 fundamentally associated with the server. As a result, the imaging information
11 is limited for use only with the server to which the imaging data was uploaded.

12 One of the most recognized printing systems implemented with a
13 web interface currently known today is the web site "Mimeo.com" provided by
14 Mimeo.com, Inc. The Mimeo.com site is an online copy center where users
15 can print a document straight from their desktop application to the Mimeo.com
16 printers. Before one can use the Mimeo.com service, specific software must
17 first be downloaded and installed onto the user's computer. Once the software
18 is installed, users can choose a Mimeo.com printer from the print menu when
19 printing from their desktop application. Users can then select the Mimeo.com
20 printer just as if it were a typical printer. Once selected, another menu then
21 pops up on users' screens that enables the user to select the current document
22 and transfer it to the Mimeo.com web site. At the site, the document is
23 transferred to a storage location assigned to the user by the Mimeo.com server,
24 and a web content with a preview of the document and printing options are
25 displayed to the user. The document remains in the storage location for user
26 selection for a limited time.

One problem with the Mimeo.com system is that the downloaded document can be used only on the Mimeo.com web site and users are not allowed to send the downloaded document to another online service. Another problem is that the user must choose a specific printer, and the document is downloaded based on the chosen specific printer. For example, if the user chooses a black and white printer, the downloaded document can be used only with the black and white printers. If the user wishes to have a color printer to print the same document, the document must be printed and downloaded again with the color printer chosen. This can be burdensome, inflexible and wasteful of bandwidth.

Another known printing system is provided on the HDE.com website by HDE Inc. This site provides an Internet printing solution that allows printing through a firewall system over the Internet. Special software must also be installed on the end-user's computer before the print jobs can be transmitted to a destination printer over the Internet. In addition, the destination printer also contains special firmware to receive these transmitted print jobs. Such preconfiguration is very burdensome and inflexible. Furthermore, it is particularly inconvenient for users of mobile computing devices, which may require connection to different network environments at various location sites.

BRIEF SUMMARY OF THE INVENTION

The present invention is directed to an improved system and method for servicing imaging data stored in a personal imaging repository. More particularly, the present invention relates to a system and method for servicing imaging data stored in a personal imaging repository by a requested web service operably connected to a computing device requesting the service.

1 The present invention provides a system that includes a
2 computing device for requesting service with the requested web service, a
3 personal imaging repository associated with a particular user profile for storing
4 imaging data that is to be accessed by the requested web service, user
5 information for allowing access to the personal imaging repository, and a
6 requested web service for servicing the imaging data stored in the personal
7 imaging repository. The personal imaging repository acts as an exchange
8 infrastructure between the imaging data and the available web services on the
9 Internet.

10 The present invention further provides a method that includes the
11 steps of requesting service from the requested web service by the computing
12 device, sending user information to the requested web service, accessing the
13 personal imaging repository using the user information by the requested web
14 service, and servicing the selected imaging data by the requested web service
15 responsive to user selection from the computing device.

16 DESCRIPTION OF THE DRAWINGS

17 FIGURE 1 is an architectural diagram of a network system in
18 which the present invention can be implemented;

19 FIG. 2 is a flowchart illustrating the preferred functionality of the
20 method of the present invention;

21 FIG. 3 is a flowchart illustrating the preferred functionality of the
22 access method of the present invention shown in FIG. 2; and,

23 FIG. 4 is another flowchart illustrating the preferred functionality
24 of the access method of the present invention shown in FIG. 2.

25 GLOSSARY OF TERMS AND ACRONYMS

1 The following terms and acronyms are used throughout the
2 detailed description:

3 Client-Server. A model of interaction in a distributed system in
4 which a program at one site sends a request to a program at another site and
5 waits for a response. The requesting program is called the "client," and the
6 program which responds to the request is called the "server." In the context of
7 the World Wide Web (discussed below), the client is a "Web browser" (or
8 simply "browser") which runs on the computer of a user; the program which
9 responds to browser requests by serving Web pages, or other types of Web
10 content, is commonly referred to as a "Web server."

11 Composition store. Composition store refers to a network service
12 or a storage device for storing imaging composition(s) that can be accessed by
13 the user or other web services.

14 Content. A set of executable instructions that is served by a
15 server to a client and that is intended to be executed by the client so as to
16 provide the client with certain functionality. Web content refers to content that
17 is meant to be executed by operation of a Web browser. Web content,
18 therefore, may non-exhaustively include one or more of the following: HTML
19 code, SGML code, XML code, XSL code, CSS code, Java applet, JavaScript
20 and C-"Sharp" code.

21 Exchange infrastructure. An exchange infrastructure is a
22 collection of services distributed throughout a network that stores imaging data
23 associated with a particular user through a user profile.

24 Hyperlink. A navigational link from one document to another,
25 from one portion (or component) of a document to another, or to a Web
26 resource, such as a Java applet. Typically, a hyperlink is displayed as a
27 highlighted word or phrase that can be selected by clicking on it using a mouse

1 to jump to the associated document or document portion or to retrieve a
2 particular resource.

3 Hypertext System. A computer-based informational system in
4 which documents (and possibly other types of data entities) are linked together
5 via hyperlinks to form a user-navigable "web."

6 Imaging composition. An imaging composition comprises links
7 to imaging data serviced as a single unit.

8 Imaging data. Imaging data refers to digital data capable of being
9 represented as two dimensional graphics, such as a Portable Document Format
10 ("PDF") file or a Joint Photographic Experts Group ("JPEG") file.

11 Imaging data store. Imaging data store refers to a network
12 service or a storage device for storing imaging data that can be accessed by the
13 user or other network services. The imaging data store preferably accepts the
14 imaging data in multiple standard file formats, and the imaging data is
15 converted into these file formats when necessary depending on the
16 implementation.

17 Internet. A collection of interconnected or disconnected networks
18 (public and/or private) that are linked together by a set of standard protocols
19 (such as TCP/IP and HTTP) to form a global, distributed network. (While this
20 term is intended to refer to what is now commonly known as the Internet, it is
21 also intended to encompass variations which may be made in the future,
22 including changes and additions to existing standard protocols.)

23 World Wide Web ("Web"). Used herein to refer generally to both
24 (i) a distributed collection of interlinked, user-viewable hypertext documents
25 (commonly referred to as Web documents or Web pages) that are accessible via
26 the Internet, and (ii) the client and server software components which provide
27 user access to such documents using standardized Internet protocols. Currently,

1 the primary standard protocol for allowing applications to locate and acquire
2 Web documents is HTTP, and the Web pages are encoded using HTML.
3 However, the terms "Web" and "World Wide Web" are intended to encompass
4 future markup languages and transport protocols which may be used in place of
5 (or in addition to) HTML and HTTP.

6 Web Site. A computer system that serves informational content
7 over a network using the standard protocols of the World Wide Web.
8 Typically, a Web site corresponds to a particular Internet domain name, such as
9 "HP.com," and includes the content associated with a particular organization.
10 As used herein, the term is generally intended to encompass both (i) the
11 hardware/software server components that serve the informational content over
12 the network, and (ii) the "back end" hardware/software components, including
13 any non-standard or specialized components, that interact with the server
14 components to perform services for Web site users. Importantly, a Web Site
15 can have additional functionality, for example, a Web site may have the ability
16 to print documents, scan documents, etc.

17 HTML (HyperText Markup Language). A standard coding
18 convention and set of codes for attaching presentation and linking attributes to
19 informational content within documents. (HTML 2.0 is currently the primary
20 standard used for generating Web documents.) During a document authoring
21 stage, the HTML codes (referred to as "tags") are embedded within the
22 informational content of the document. When the Web document (or HTML
23 document) is subsequently transferred from a Web server to a browser, the
24 codes are interpreted by the browser and used to display the document.
25 Additionally in specifying how the Web browser is to display the document,
26 HTML tags can be used to create links to other Web documents (commonly
27 referred to as "hyperlinks"). For more information on HTML, see Ian S.

1 Graham, The HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN
2 0471-11894-4).

3 HTTP (HyperText Transport Protocol). The standard World
4 Wide Web client-server protocol used for the exchange of information (such as
5 HTML documents, and client requests for such documents) between a browser
6 and a Web server. HTTP includes a number of different types of messages
7 which can be sent from the client to the server to request different types of
8 server actions. For example, a "GET" message, which has the format GET
9 <URL>, causes the server to return the document or file located at the specified
10 URL.

11 URL (Uniform Resource Locator). A unique address which fully
12 specifies the location of a file or other resource on the Internet or a network.
13 The general format of a URL is protocol://machine address:port/path/filename.

14 User Information. User information is identification and security
15 information used in accessing imaging composition(s) and imaging data
16 associated with a particular user profile. It is preferably accessed either
17 directly or indirectly through methods provided by an extension component
18 integrated into the web browser.

19 PDA (Personal Digital Assistant). A small hand-held computer
20 used to write notes, track appointments, email and web browser with generally
21 with far less storage capacity than a desktop computer.

22 Personal imaging repository. A personal imaging repository is a
23 conceptual term describing the exchange infrastructure used to exchange
24 imaging composition and imaging data with web services. Users are associated
25 with their imaging data through user profiles.

1 Broadly stated, the present invention is directed to an improved
2 system and method for servicing imaging data stored in a personal imaging
3 repository by a requested web service operably connected to a computing
4 device requesting the service. The system and method provide services to the
5 selected imaging data stored in a personal imaging repository, which acts as an
6 exchange infrastructure between the imaging data and available web services
7 on the Internet. Once the imaging data is stored in the personal imaging
8 repository, it can be freely used by other web services or the user at a later
9 time. Furthermore, it is no longer necessary for the imaging data to be
10 downloaded to the requested web service, since services are configured to
11 directly access the personal imaging repository.

12 The preferred network system in which the present invention can
13 be implemented is shown in FIG. 1 and indicated generally at 10. The
14 illustrated current preferred network system is just one of many ways of
15 implementing the network topology of the present invention. As a result, it
16 should be understood that other network topologies are contemplated and are
17 within the scope of the present invention. As shown in FIG. 1, a computing
18 device 12 including the typical components of a general computer, such as an
19 input interface 14 and display interface 16, is connected to a web service 18
20 provided by a web service server computer 20 via a network 22. The
21 computing device 12 establishes a connection with the web service server
22 computer 20 upon request for a web content 24 from the requested web service
23 18. The computing device 12 includes a browser 26 that can display and
24 execute the web content 24, which causes the browser to send user information
25 28 stored on the computing device to the requested web service 18.

26 Because of the various services that each web service can offer,
27 the web content 24 that is available from each web service differs greatly

1 depending upon the services a particular web site offers. In fact, the range of
2 services that the web services can offer are limitless. For example, the most
3 common services envisioned are printing or copying. However, other services,
4 such as email services, scanning services or auction services, are contemplated
5 and should be considered within the scope of the present invention.

6 The user information 28 comprises identification and security
7 information used in accessing imaging composition(s) and imaging data stored
8 in a personal imaging repository 30 associated with a particular user profile.
9 The personal imaging repository 30 preferably includes an imaging data store
10 32, 32', i.e., a digital memory, for storing the imaging data 34, 34' and a
11 composition store 36 for storing imaging composition(s) 38, 38' of the imaging
12 data that are serviced as a single unit. The personal imaging repository 30 is
13 provided by a store server 40 that is operatively connected to the network 22.
14 An imaging composition 38, 38' preferably comprises links to the imaging data
15 34, 34', which can be located at another web site. As a result, the composition
16 store 36 stores only the imaging compositions 38, 38'. The imaging data store
17 32, on the other hand, is any imaging data store located on any computer that
18 contains the imaging data 34, 34'. More specifically, each web service can
19 have its own imaging data store 34' available to the public.

20 For example, at some previous time, a user may have printed
21 articles from a web service site providing a web service server 42, resulting in
22 an imaging composition being created and stored in the user's composition
23 store 38'. Since the created imaging composition 38' contains only the link to
24 the imaging data 34' for the articles stored on the web service site and another
25 imaging data 34 stored on the store server 40, the imaging data 34' for the
26 articles is not in the imaging data store 32' located on the store server 40.
27 Rather, the imaging data 34' is stored in the imaging data store 32' located on

1 the web service server 42. Of course, users will have an imaging data store 32
2 that belongs to their user identification where they can store imaging data 34,
3 which is the imaging data store shown in the store server 40. As a result, the
4 term "personal imaging repository" 30 is meant as a conceptual term for an
5 exchange infrastructure between the imaging data and the available web
6 services on the Internet. Similarly, the term "web," which denotes millions of
7 distinct servers that comprise the web, does not actually do anything itself. In
8 the present invention, the servers serving the imaging data store 32 and the
9 composition store 36 are physical implementations of the personal imaging
10 repository 30 as a concept.

11 Because the web services are configured to access the personal
12 imaging repository when a service is requested, the personal imaging
13 repository 30 becomes the exchange infrastructure for the imaging data for the
14 web services that are available on the Internet. Users no longer must remember
15 the directory in which they placed their imaging data. When the user requests
16 web services for any of the imaging data stored in the personal imaging
17 repository 30, the requested web service is configured to access the imaging
18 data indicated by the selected imaging composition stored in the personal
19 imaging repository. Put differently, only the selected imaging composition will
20 be serviced by the requested web service. Furthermore, once the imaging data
21 has been serviced once, it is saved in the personal imaging repository, and can
22 be freely utilized by any other available web services.

23 Also as shown, both the imaging data store 32, 32' and the
24 composition store 36 include a conversion logic 44, 44' for converting the
25 imaging data in a requested specified format if necessary. It is preferred that
26 the imaging data is available in a plurality file formats, such as JPEG, Graphics
27 Interchange Format ("GIF"), Portable Network Graphics Format ("PNGF"),

1 Tagged Image File Format ("TIFF"), PDF and Microsoft Windows bitmap
2 format ("BMP"). Therefore, the specified format can be any of the preferred
3 plurality of file formats indicated. The composition store 36 preferably
4 performs the conversion for the imaging data. However, the imaging data
5 store, other web services or devices can also convert the imaging data
6 depending on the chosen implementation. It should, therefore, be understood
7 that other implementations can be used and within the scope of the present
8 invention.

9 It should be further noted that the personal imaging repository 30
10 can represent any type of data storage device. In fact, the data storage device
11 30 does not necessarily have to be located within the store server 40. The
12 personal imaging repository 30 can be located, for example, on another storage
13 medium, which the client machine can access through alternative
14 communication links. It is currently preferred to include the personal imaging
15 repository 30 with the store server 40, which can be accessed by any computing
16 devices or servers with the user information 28. However, the user information
17 need not physically reside on a computing device. Other implementations of
18 the user information are also available, such as a login and password, and these
19 implementations are within the scope of the present invention.

20 Turning to an important aspect of the present invention, a flow
21 chart of the preferred functionality of the method used with the present
22 invention is shown in FIG. 2, and indicated generally at 50. The process is
23 initiated when the browses to a requested web service (block 52). Accordingly,
24 the browser first requests web content from the requested web service (block
25 54), and the request is received by the requested web service (block 56). The
26 requested web service accordingly responds to the request with web content
27 being sent to the browser (block 58). After the browser receives the web

1 content (block 60), it is displayed and executed by the browser (block 62). The
2 web content first causes the browser to send user information that is stored on
3 the computing device to be sent to the requested web service (block 64). Then,
4 the web content also causes the browser to be directed to a requested web
5 service (block 66).

6 It should be noted that although in this implementation, the web
7 content causes the user information to be sent, there are other ways to trigger
8 the user information to be sent. For example, when the computing device
9 requests the requested web service, the computing device can be configured to
10 sent the user information directly to the requested web service without the need
11 of the browser or the web content to initiate the sending of the user
12 information. These other implementations are contemplated are should be
13 considered within the scope of the present invention.

14 A flow chart of the preferred functionality of a service method for
15 accessing the personal imaging repository is shown in FIG. 3, and indicated
16 generally at 50. As shown in FIGS. 2 and 3, the requested web service, using
17 the user information sent from the browser, accesses the personal imaging
18 repository (block 68), more specifically, for services of the imaging data. The
19 requested web service first connects with the composition store of the personal
20 imaging repository (block 70), and obtains a list of the imaging composition(s)
21 (block 72). After a list is compiled, the requested web service constructs a web
22 content that displays a list of the imaging composition(s) stored in the
23 composition store and provides control for selecting the available services from
24 the web service (block 74). The constructed web content is sent to the browser
25 (block 76). After the browser receives the constructed web content (block 78),
26 it is executed and displayed to the user (block 80). The user returns the
27 selections of the imaging composition(s) from the list and the desired service(s)

1 to the web service (block 82), and the requested web service accordingly
2 requests the selected composition(s) in a specified form from the composition
3 store (block 84).

4 It should be noted that there are various ways to implement the
5 present invention. For example, the selection of the imaging compositions and
6 selection of the desired services can be done at separate web services. In other
7 words, the user can use a web service to obtain and select imaging
8 compositions, and while another web service to select the available desired
9 services for the selected imaging compositions. These various implementations
10 are contemplated and are within the scope of the present invention.

11 After the composition store receives the request from the
12 requested web service (block 86), each imaging data indicated by the selected
13 imaging composition(s) is then obtained from its proper location by the
14 requested web service (block 88). Once the imaging data is obtained, it is next
15 determined whether a conversion is needed for the imaging data (block 90). If
16 so, the composition store converts the imaging data from the selected
17 composition(s) in the requested specified format (block 92). The composition
18 store finally sends the imaging data from the selected imaging composition(s)
19 in the specified format to the requested web service (block 94). The web
20 service server receives the imaging data in the specified format from the
21 composition store (block 96), and the requested web service provides the
22 desired service(s) for the imaging data (block 98).

23 A flow chart of the preferred functionality of an add method for
24 accessing the personal imaging repository is shown in FIG. 4, and indicated
25 generally at 100. As shown in FIGS. 2 and 4, the requested web service, using
26 the user information sent from the browser, accesses the personal imaging
27 repository (block 68), more specifically, for adding the imaging data. The

1 requested web service first logs into the imaging data store service (block 102).
2 It is then determined whether the connection to the imaging data store is
3 successful (block 104), and if not, an error message is sent to the user (block
4 106). Once it is established that a connection to the imaging data store is
5 successful (block 104), the requested web service converts the imaging data
6 into a predefined format, such as JPEG, (block 108) and accordingly transfers
7 the imaging data in the converted format to the imaging data store (block 110).
8 The requested web service obtains a reference to the transferred imaging data
9 (block 112), and it will log out of the imaging data store (block 114) and log
10 into the composition store (block 116). Again, it is determined whether the
11 connection to the composition store is successful (block 118). Another error
12 message is sent to the user (block 120) if the connection was unsuccessful
13 (block 118). After a successful connection to the composition store (block
14 118), the requested web service creates an imaging composition (block 122)
15 and adds the reference to the imaging data stored in the imaging data store
16 obtained earlier in the imaging composition (block 124). This newly created
17 imaging composition is then saved to the composition store (block 126), and
18 further set as a selected imaging composition in the composition store (block
19 128). Because the imaging composition is set as the selected composition, it
20 will be used by web services that make use of the selected composition of the
21 personal imaging repository. Finally, the requested web service logs out of the
22 composition store (block 130).

23 It should be noted that the order of the access method can be
24 varied and changed depending on the implementation of the present invention.
25 An alternative method is logging into either one of the stores, and upon
26 successful connection, the requested web service then immediately logs into
27 the other store prior to performing any further steps. More specifically, for

1 example, the requested web service can first log into the imaging data store.
2 Upon a successful connection with the imaging data store, the requested web
3 service next logs into the composition store. Once it is established that the
4 requested web service has successfully logged into both the imaging data store
5 and the composition store, only then would the remaining steps be processed.
6 This alternative method ensures that the imaging data is not unnecessarily
7 transferred to the imaging data store when an imaging composition of the
8 transferred imaging data can not be added to the composition store due to a
9 connection failure. This method is especially preferred when the composition
10 store resides on a separate location other than the imaging client as shown in
11 FIG. 2.

12 From the foregoing description, it should be understood that an
13 improved system and method for preparing imaging data for printing to a
14 requested web service has been shown and described, which has many
15 desirable attributes and advantages. The system and method provides for
16 servicing imaging data stored in a personal imaging repository by a requested
17 web service operably connected to a computing device requesting the service.
18 The imaging data is stored in a personal imaging repository, which acts as an
19 exchange infrastructure between the imaging data and available web services.
20 Because the web services are configured to access the personal imaging
21 repository for the imaging data using the user information, it is no longer
22 necessary for the imaging data to be uploaded to the requested web service.
23 Rather, once the imaging data is stored in the personal imaging repository, it
24 can be used by any other web services or the user at a later time.

25 While various embodiments of the present invention have been
26 shown and described, it should be understood that other modifications,
27 substitutions and alternatives are apparent to one of ordinary skill in the art.

1 Such modifications, substitutions and alternatives can be made without
2 departing from the spirit and scope of the invention, which should be
3 determined from the appended claims.

4 Various features of the invention are set forth in the appended
5 claims.